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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LIU, LI

ART UNIT	PAPER NUMBER
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2613

DATE MAILED: 08/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/622,113

Applicant(s)

POHJOLA ET AL.

Examiner

Li Liu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,8-18 is/are rejected.
- 7) ☒ Claim(s) 2-7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. The certified copy of the foreign priority document has not been received.

Drawings

2. The drawings are objected to because there are no labels for block 112, 120 and 114 in Figure 1. These blocks need to have descriptive labels under 37 CFR 1.84(n) and 1.84(o). For example, "CO" may be used for the label of block 112 and "WDM" may be used for the label of block 120.

Specification

3. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.

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(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT

(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A

COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or

REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a).

"Microfiche Appendices" were accepted by the Office until March 1, 2001.)

(f) BACKGROUND OF THE INVENTION.

(1) Field of the Invention.

(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

(g) BRIEF SUMMARY OF THE INVENTION.

(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(i) DETAILED DESCRIPTION OF THE INVENTION.

(j) CLAIM OR CLAIMS (commencing on a separate sheet).

(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A

"Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

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Examiner suggests that the section headings are inserted into the specification. For example, "BACKGROUND OF THE INVENTION" should be inserted before [0001], and "BRIEF DESCRIPTION OF THE DRAWING" should be inserted before [0035].

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 9-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

1) Claims 9 and 11 recite the limitation "the optically pumped sources" in line 2. There is insufficient antecedent basis for this limitation in the claim. The optically pumped sources have not been introduced in claim 1.

2) Claim 13 recites the limitation "the pumping light" in line 2. There is insufficient antecedent basis for this limitation in the claim. The pumping light has not been introduced in claim 1.

Any claim not specifically addressed, above, is being rejected as incorporating the deficiencies of a claim upon which it depends.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 1, 8, 14, 16, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Darcie et al (US 5,559,624).

1) With regard to claim 1, Darcie et al disclose an optical data transmission system, the optical data transmission system comprising

a hub (CENTRAL OFFICE CO 10 in Figure 11), a kerb location (the combination of Remote Node RN 90 and RECEIVER/MODULATOR 840 can be interpreted as the kerb location, Figure 11), a converter (WAVELENGTH SHIFT/MODULATOR 850 in Figure 11), an optical router (WDM/R 890 in Figure 11), and a plurality of ONUs (100, 200, ..., 400 in Figure 11),

the ONUs being capable of transmitting respective data signals (UPSTREAM DATA 123 in Figure 11) to the kerb location,

the optical router being capable of routing wavelength channels having predefined wavelength ranges assigned to respective ONUs for transmission to the hub (12 in Figure 11, column 3 line 65-67, and column 6 line 64-67), and

the converter being capable of converting the data signals (upstream data 123 in Figure 11) into the wavelength channels (column 9 line 45-60).

2) With regard to claim 8, Darcie et al disclose that the respective ones of the ONUs are sufficiently similar that they are interchangeable (column 2 line 24-30 and line 58-67).

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3) With regard to claim 14, Darcie et al disclose that the optical router is a WDM (890 in Figure 11, column 5 line 32-33).

4) With regard to claim 16, Darcie et al disclose a method of transmitting data in an optical data transmission system, the optical data transmission system comprising

a hub (CENTRAL OFFICE CO 10 in Figure 11), a kerb location (the combination of Remote Node RN 90 and RECEIVER/MODULATOR 840 can be interpreted as the kerb location, Figure 11), a converter (WAVELENGTH SHIFT/MODULATOR 850 in Figure 11), an optical router (WDM/R 890 in Figure 11), and a plurality of ONUs (100, 200, ..., 400 in Figure 11),

the method comprising the steps of:

the ONUs transmitting respective data signal to the kerb location (UPSTREAM DATA 123 in Figure 11); and

the optical router routing wavelength channels having predefined wavelength ranges assigned to respective ONUs for transmission to the hub (12 in Figure 11, column 3 line 65-67, and column 6 line 64-67),

the converter converting the data signals (upstream data 123 in Figure 11) into the wavelength channels (column 9 line 45-60).

5) With regard to claim 17, Darcie et al disclose an optical router for an optical data transmission system, the optical data transmission system comprising

a hub (CENTRAL OFFICE CO 10 in Figure 11), a kerb location (the combination of Remote Node RN 90 and RECEIVER/MODULATOR 840 can be interpreted as the kerb location, Figure 11), and a plurality of ONUs (100, 200, ..., 400 in Figure 11),

the ONUs being capable of transmitting respective data signals to the kerb location (UPSTREAM DATA 123 in Figure 11),

the optical router (WDM/R 890 in Figure 11) being capable of routing wavelength channels having predefined wavelength ranges assigned to respective ONUs for transmission to the hub (12 in Figure 11, column 3 line 65-67, and column 6 line 64-67), and

the optical router comprising a converter (WAVELENGTH SHIFT/MODULATOR 850 in Figure 11) to convert the data signals into the wavelength channels (column 9 line 45-60).

6) With regard to claim 18, Darcie et al disclose a converter for an optical data transmission system, the optical data transmission system comprising

a hub (CENTRAL OFFICE CO 10 in Figure 11), a kerb location (the combination of Remote Node RN 90 and RECEIVER/MODULATOR 840 can be interpreted as the kerb location, Figure 11), and a plurality of ONUs (100, 200, ..., 400 in Figure 11),

the ONUs being capable of transmitting respective data signals to the kerb location (UPSTREAM DATA 123 in Figure 11),

the converter (WAVELENGTH SHIFT/MODULATOR 850 in Figure 11) being capable of converting the data signals (upstream data 123 in Figure 11) into wavelength channels having predefined wavelength ranges assigned to respective ONUs (column 9 line 45-60), and

the optical router (WDM/R 890 in Figure 11) being capable of routing the wavelength channels for transmission to the hub (12 in Figure 11, column 3 line 65-67, and column 6 line 64-67)

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Darcie et al (US 5,559,624) in view of Chan et al (*ELECTRONICS LETTERS*, January 3, 2002, Vol. 38, No. 1, page 43-45).

Darcie et al disclose all of the subject matter as in claim 1 above, but Darcie et al do not teach that the optical router is an arrayed waveguide grating (AWG).

However, Chan et al, in the same field of endeavor, teach that the optical router is an arrayed waveguide grating (WGR in Figure 1, the AWG devices are also commonly referred to as wavelength grating routers, ref. McGreer K. McGreer, *Arrayed Waveguide Gratings For Wavelength Routing*, IEEE Communication Magazine, Vol. 36, No. 12, pp. 62-68 (1998)). The WGR is employed to route different wavelength channels to different ONUs.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the AWG taught by Chan et al to the system of

Darcie et al so that a lower loss, flatter passband optical router can be obtained, and also it is easier to realize on an integrated-optic substrate.

Allowable Subject Matter

10. Claims 2-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claims 9-13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: the present invention comprises an optical communication system with the cost sharing features. The injection locked lasers (Laser cavity) are used as the optically pumped sources, and the laser cavity receives optical injection light from the hub. And the injection light is from a specific injection source and is different from the downstream signal. And also the laser cavity is optically pumped by the data modulated pumping light. The closest prior art, Darcie et al (US 5,559,624) and Chan et al (*ELECTRONICS LETTERS*, January 3, 2002, Vol. 38, No. 1, page 43-45) shows a similar system. However, the prior art uses the downstream signal as the "injection source" and an electrical signal not optical signal is used to modulate the injection locked lasers or modulators.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Deng et al (US 2002/0196491) disclose a passive optical network in which a plurality of wavelength division multiplexed optical signals are exchanged between terminals.

Dyke et al (US 6,870,836) disclose a system to enable the transfer of IP format data over a point-to-multipoint PON.

Darcie et al (US 5,694,234) disclose a PON that spectrally slices optical signals transmitted in both upstream and downstream directions utilizing WDM routing.

Kim et al disclose a low-cost WDM source with an ASE injected Fabry-Perot semiconductor laser (IEEE Photonics Technology Letters, Vol. 12, No. 8, August 2000, page 1067-1069).

Park et al disclose a DWDM-Based FTTC access network (Journal of Lightwave Technology, Vol. 19, No. 12, December 2001, page 1851-1855).

Healey et al disclose a spectral slicing WDM-PON using wavelength-seeded reflective SOAs (ELECTRONIC LETTERS, September 13, 2001, Vol. 37, No. 19, page 1181-1182).

Morales et al (US 5,706,111) disclose an optical communication network in which a converter is used to convert the fixed wavelength from subscriber into another wavelength to be transmitted to CO.

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li Liu whose telephone number is (571)270-1084. The examiner can normally be reached on Mon-Fri, 7:30 am - 5:00 pm, alternating Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571)272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Li Liu
August 2, 2006



SHUWANG LIU
SUPERVISORY PATENT EXAMINER